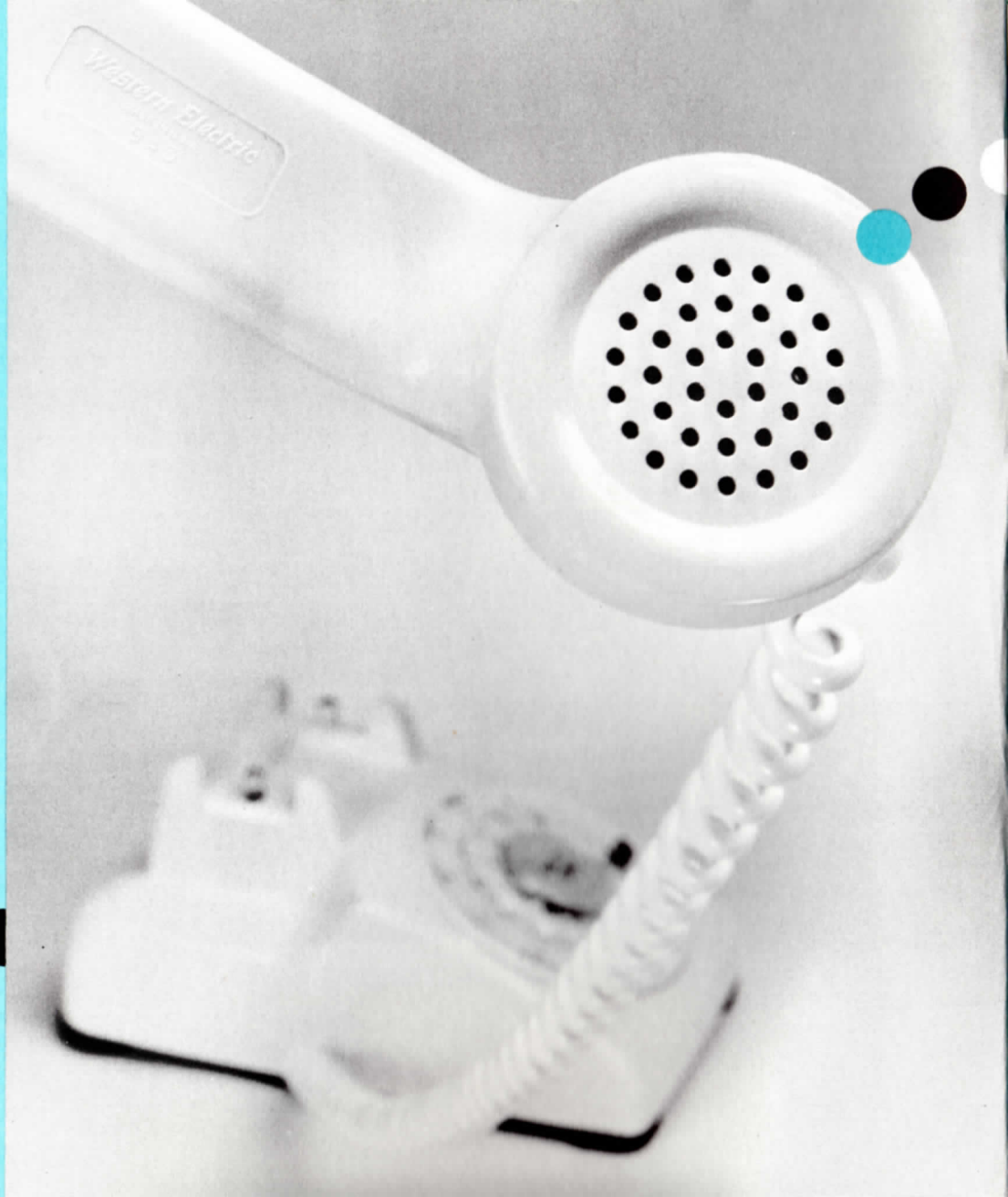
This is WESTERN ELECTRIC

Manufacturing and supply unit of the Bell System

Every time a Bell Telephone user reaches for a telephone handset he is literally in touch with Western Electric. His or her fingers close over raised letters, on the handset's underside, which read Western Electric.



TELEPHONES

and Western Electric...

AMERICANS HAVE BECOME ACCUSTOMED to the communications miracles performed with Bell System telephones. A housewife in Denver answers her phone and speaks to her husband who has just landed at Idlewild airport in New York. Moments later, her eleven-year-old daughter uses the same instrument to call a friend across the street about a homework assignment.

Such events are routine for most Americans because they have come to expect that their telephones will work well and dependably at every use. Yet, to make possible a form of communication that would have been regarded as miraculous little more than a half-century ago has required remarkable and continuous coordination of human ingenuity and energy for more than 80 years.

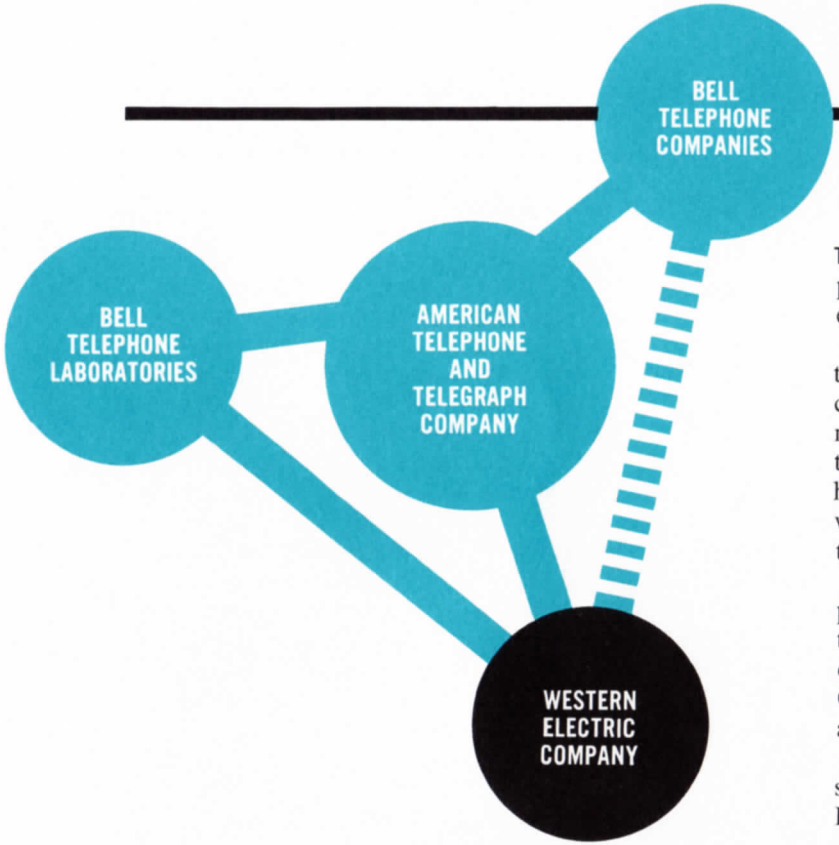
Out of this coordination, there grew very early three distinct activities—research, manufacture, and operation—each equally necessary to provide good telephone service. By applying each activity in proper relation to the others, the Bell System has been largely responsible for providing Americans with the best telephone service in the world.

Telephone service extends to the far corners of the earth, making it possible under normal conditions for a Bell telephone user to be connected with any one of more than 140,000,000 telephones—some 98 per cent of all the telephones in the world. Here in the United States, each Bell telephone leads to more than 78,000,000 other Bell and connecting telephones, all integrated by switching systems through a vast network of wire, cable and radio relay.

Since 1882, when it became a part of the Bell System, Western Electric has manufactured millions of telephones, billions of feet of wire and cable, millions of manual and dial switching units, plus huge amounts of other communications apparatus. It has purchased from thousands of companies a great variety of supplies, equipment and materials for use in the Bell System.

Good telephone service is one of our nation's most vital assets. On the following pages is the story of Western Electric's part in helping to develop and provide it.

WESTERN ELECTRIC...
part of the Bell System



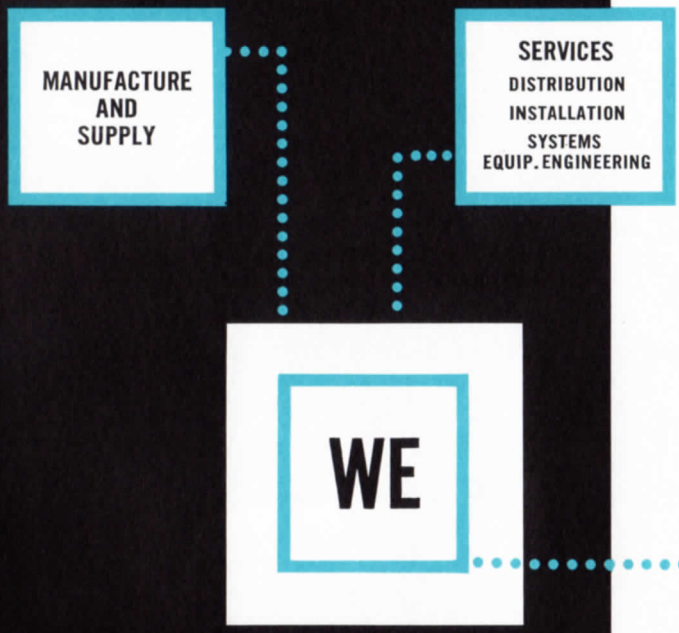
TO MEET THE NEEDS of the Bell Telephone operating companies, which are its customers, Western Electric provides equipment and services quickly and economically.

Backing up this activity is Bell Telephone Laboratories—the "research" organization of the Bell System's coordinated effort—which creates and develops new equipment through basic communications research. Scientists at the Laboratories, including the branch laboratories which have been established at many of the plants, work closely with Western Electric and operating company engineers to translate ideas into workable telephone equipment.

The Bell Telephone companies deal directly with the public, handling more than 80 billion telephone conversations a year plus an increasingly large amount of data communication. The American Telephone & Telegraph Company provides advisory assistance and coordinates the activities of all the Bell companies.

These companies, working as a team, provide the swift, dependable communications network which is the Bell Telephone System.

WESTERN ELECTRIC: The Job

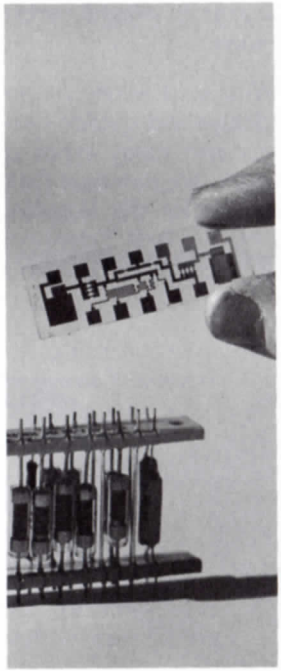


WESTERN ELECTRIC fulfills its function as an integral part of the Bell System in three principal ways.

MANUFACTURE AND SUPPLY: Western Electric *manufactures* to uniform standards of design and quality hundreds of communications products and many types of equipment for the Bell System network. We *purchase* from thousands of large and small companies the supplies, equipment and materials needed by the Bell Telephone companies as well as for our own manufacturing operations.

SERVICES: Western Electric's Service Division brings together the once separate functions of *Systems Equipment Engineering, Installation* and *Distribution* into a single organization. Operating regionally, it provides the Bell companies with high quality service through the coordinated application of our energies to meet their needs.

DEFENSE AND SPACE ACTIVITIES: WE contributes to the nation's defense and space efforts by providing the U.S. Government with planning, management services and manufacturing abilities on projects requiring communications skills.



Developed by Bell Laboratories and manufactured by WE, thin film circuits perform the same function as much larger assemblies of separate components.

TECHNOLOGY

Among WE's important technological successes is the artificial growing of quartz crystals for filters, oscillators.

At WE's Princeton Research Center a technician studies the density and rate of crystallization of a plastic material.

IN THE SCIENCE of communication, rapid and startling changes have followed each other closely, particularly in recent years. In telephony, for example, some two-thirds of the products Western Electric makes for the telephone companies were introduced or substantially modified after 1950.

To produce them, Western Electric has constantly improved its processes, methods and equipment to take full advantage of the developments which have flowed from Bell Laboratories. With the development of thin film circuits by Bell Laboratories, for example, WE engineers found a way to mass produce these precise circuits to extremely high standards of reliability, using an unusual production line passing through a vacuum.

Other advances in the electronic manufacturing arts at WE have included such achievements as the artificial growing of quartz crystals and the development of electron tubes, designed to work faultlessly in undersea repeaters for a minimum of 20 years.

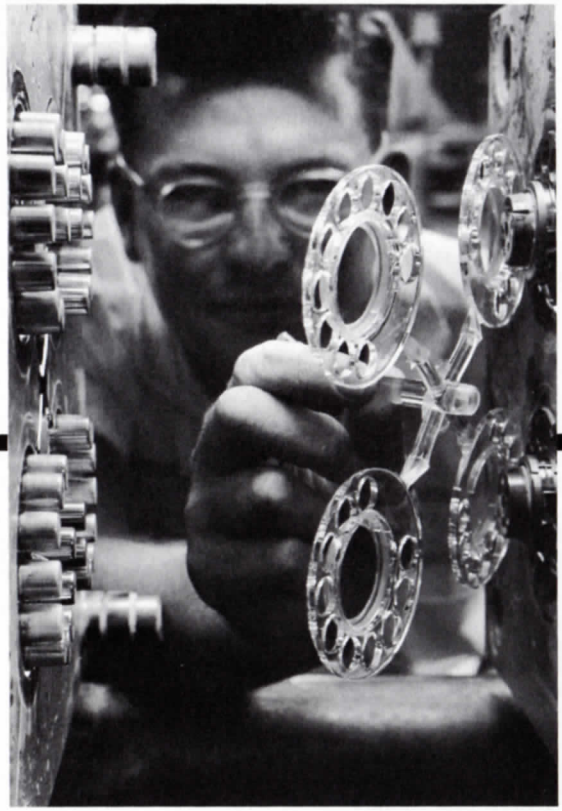
Closely tied to WE's technological gains are new, efficient facilities. Since 1950, 26 distributing houses and 7 plants, such as the Omaha Works above, have been built.

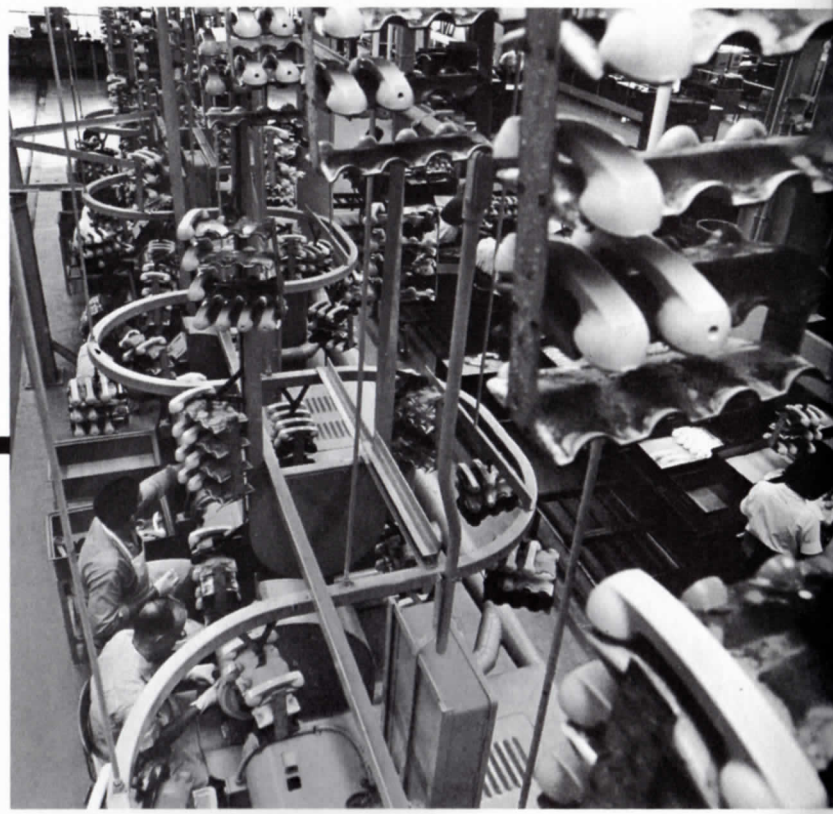
Another product of Bell Labs-WE teamwork, armorless undersea telephone cable is designed to withstand pressures exceeding 5,850 psi at the ocean's bottom and do it for at least 20 years.

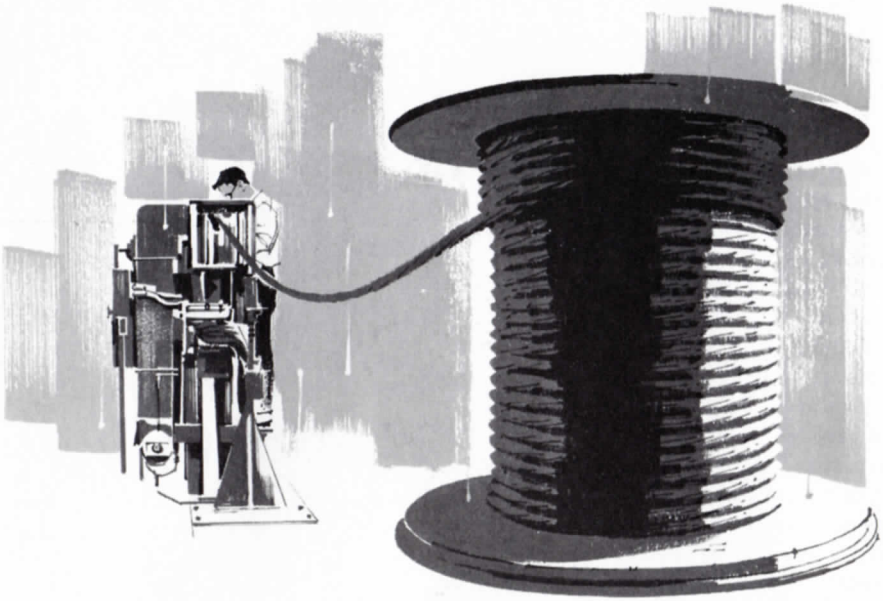
The coming years will undoubtedly see even greater technological advances by Western Electric. To support such work in the future, an engineering research center has been established near Princeton, New Jersey. Here, engineers and scientists are doing basic research in the application of machines, materials and computers to manufacturing processes.

As in the past, more useful, more abundant communications for the public will come about through the unified efforts of all Western Electric and Bell System people working as a team toward a common goal.

At the rate of many hundreds a day, telephone sets of all kinds come off the assembly lines at WE's Indianapolis Works—the largest telephone set manufacturing plant in the world. Right: modern facilities in telephone manufacture. Below: dial finger-wheels are removed from mold. The telephone set, to which the wheel will be attached, takes less than an hour of human effort to produce.





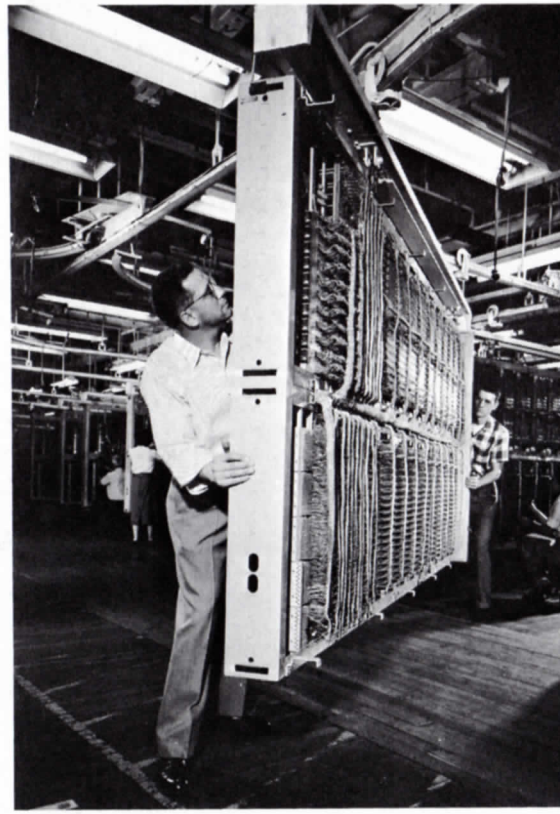


MANUFACTURE

EACH YEAR, Western Electric produces more than 50,000 different items of communications equipment covering a tremendous range including telephone sets, switchboards, cable, relays, transistors and diodes. Major manufacturing plants in 13 cities and several tributary shops satisfy the demand for these products.

Some of our products are made in quantity—telephones, cable, switches, repeaters. Many, though, are made only in tens or hundreds to perform specialized communications tasks or to keep serviceable Bell System equipment that has been long in use.

The "brains" of the telephone system are complex switching units, located in telephone company central offices. Huge frames, such as the crossbar equipment below, are made at WE's Hawthorne, Oklahoma City, Omaha, Columbus Works.

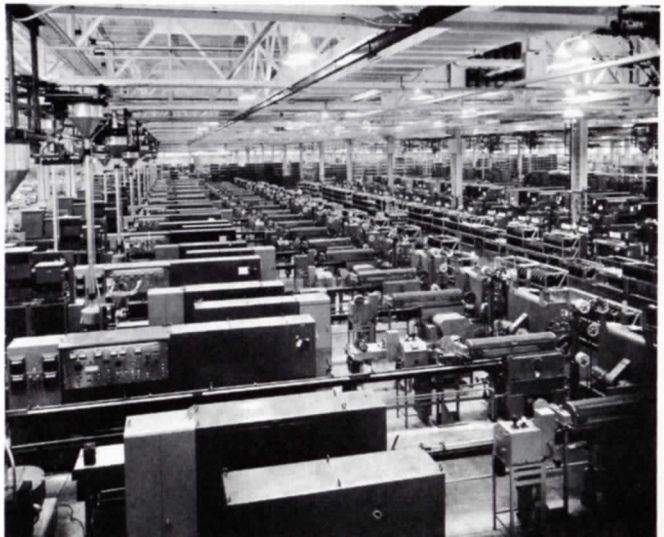


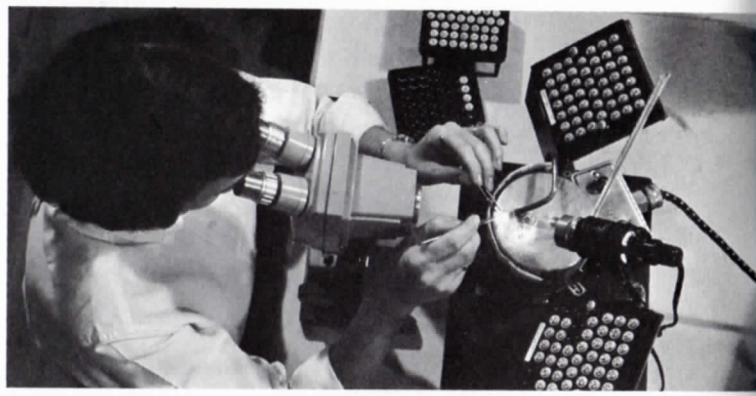
The products Western Electric makes vary greatly in size and complexity. They include giant reels of cable, tall central office switching equipment and tiny thermistors. Also produced are relatively simple mechanical switches and extremely high-speed equipment as intricate as that employed in TASI (Time Assignment Speech Interpolation), a system which has doubled the capacity of undersea cables by permitting utilization of the normal pauses that occur during telephone conversations.

But each of WE's products bears a common mark. Each has been subjected to rigid inspection and tests in conformance with unyielding Bell System standards.

For products of this character, especially in these days of advancing costs, you would expect a significant reflection in the prices charged. And yet, the level of Western Electric prices to the Bell Telephone companies for the products we make is now lower than at the beginning of 1950.

B





A

a. With the introduction of *new arts* devices and components, production methods become more and more exacting.

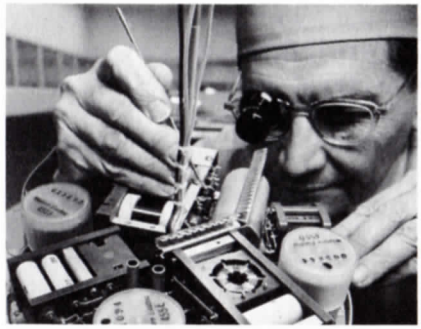
b. Cable insulating at the Omaha Works and other locations is performed by a process of extrusion on lanes of machines like these. The insulating material is polyethylene and is applied in a continuous operation.

c. Fine gauge wire is a product for which WE has long been noted. Spools of wire are drawn through dies of diminishing sizes down to diameters as small as 3/1000ths of an inch.

d. Undersea cables are engineered to function faultlessly for years. The amplifying unit for an undersea repeater undergoes rigid inspection at Kearny's Clark Shops.

e. From our many works locations comes an impressive quantity and variety of carrier and radio relay equipment. These products form the backbone of long distance telephony.

C



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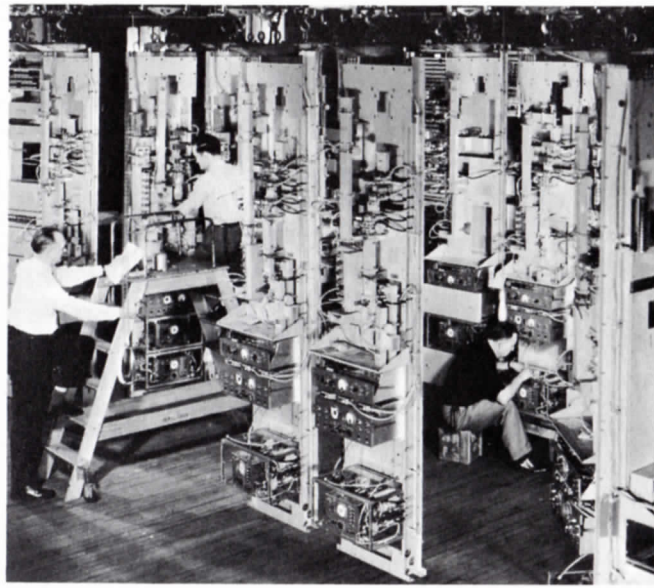
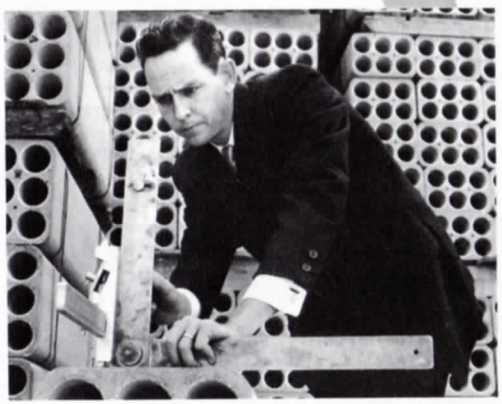


E

SUPPLY

WE inspectors perform on-the-spot checks at suppliers' plants around the world. Below: an inspector checks sample section of concrete conduit.



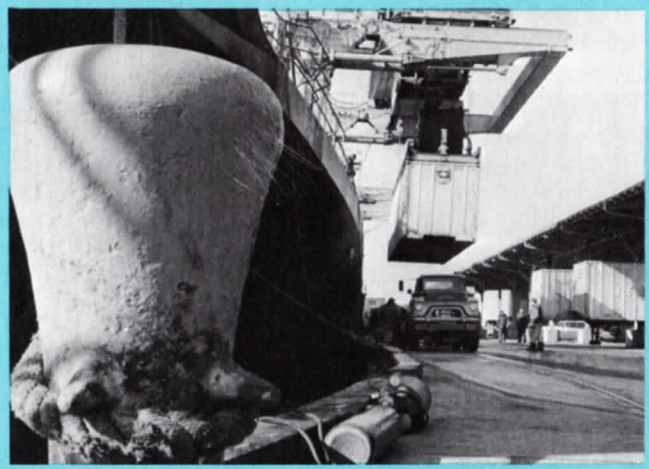
THE ALERT AMERICAN HOUSEWIFE knows the value of comparison shopping. She buys in quantity when it will save in the long run, but she's also smart enough to pass up questionable "bargains." She knows that quality must be considered along with the price.

As purchasing agent, Western Electric uses the same techniques when it goes shopping for the Bell System and its objectives are the same: to get good quality products and the greatest value for every dollar spent. At the same time, WE's purchasing people are guided by certain well-established principles. They give fair and impartial consideration to any reputable concern, large or small. They award business to dependable sources on the basis of the best price for material of desired quality and assured availability. They continually seek new materials and processes to improve quality and lower costs.

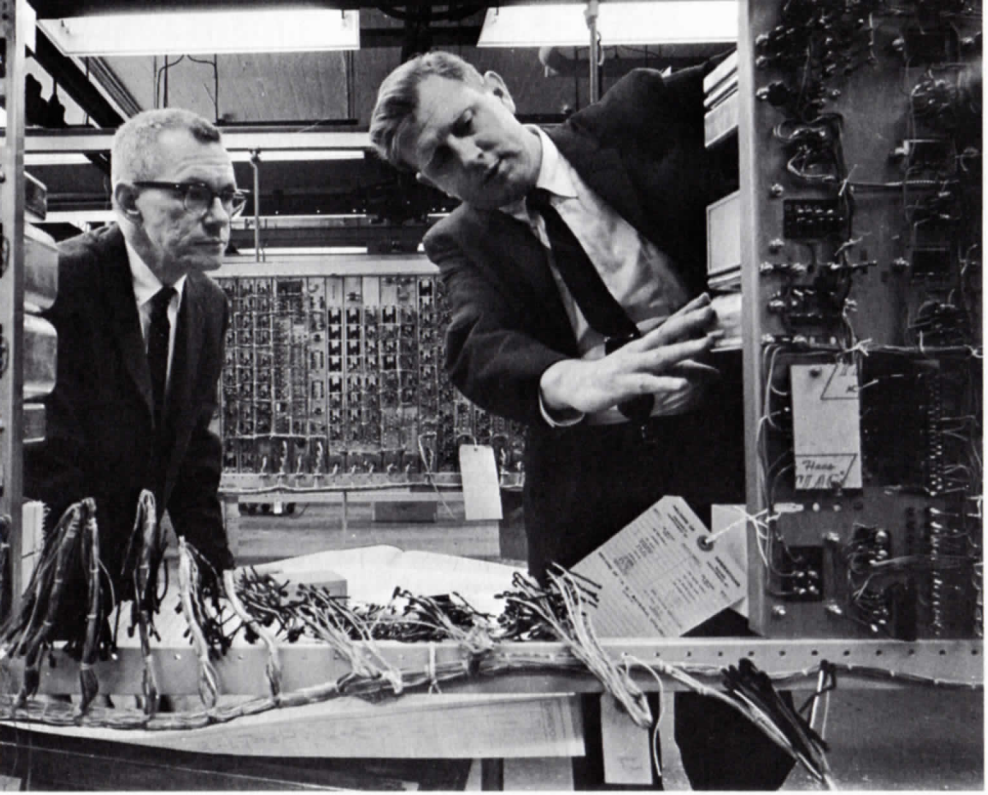
In recent years Western Electric has paid more than $1,000,000,000 annually to outside suppliers for materials for the Company's manufacturing operations and for ready-to-use supplies and equipment for the Bell operating companies, roughly one-third of the total amount being spent on the latter. More than 40,000 companies share in this volume and nine out of ten are small businesses, employing fewer than 500 people.

When WE's buying specialists go to market, they take along a huge shopping list of more than 150,000 different items, including copper, steel, aluminum, plastics, telephone directories, poles, office machines and linemen's tools.

Coordinating their efforts with purchasing are WE's transportation specialists—a corps of experts who make certain that the millions of tons of material necessary in WE's operations move quickly and economically and arrive as needed.



More than 40,000 outside firms, ranging from pole suppliers in the South (far left) to tin mining companies in the jungles of Malaya, help Western Electric meet the supply needs of the Bell System. Supplies, raw materials and equipment shipments for the Bell System are expedited by Western Electric's transportation group. Left: WE-made equipment in removable trailer container is transferred to ship for water portion of routing. The truck-ship transport technique is called "fish-back."



Switching frame being readied for a Bell Company is examined by Western Electric planning and equipment engineers.

WE equipment engineers review plans with a Bell Telephone Company engineer at a central office installation.

Microfilm reader is used by Western Electric systems equipment engineers to check plans for new telephone central office.

SERVICE . . .

Systems Equipment Engineering

WESTERN ELECTRIC'S planning of a central office installation for one of the Bell Telephone companies begins with our Systems Equipment Engineers. They determine the precise requirements of the job, the specific quantities and types of equipment to be manufactured by WE plants, and then prepare detailed specifications and drawings for Western Electric installers to interconnect the equipment. They have as their most important single function the responsibility for making certain that each of the myriad components in the vast Bell System communications network is compatible with all the other elements of the system.

Some of them—the standards engineers—work with Bell Laboratories to convert new developments into uniform "building blocks" that can be used in many combinations with existing equipment. Others—the line engineers—work directly with the telephone companies in planning any installation of telephone office equipment, whether it is a complete new central office or a modification of existing equipment. They are in frequent contact with telephone company engineers and serve in a liaison capacity with the WE manufacturing location making the equipment. In addition, they work with the WE installers until the job is completed and turned over to the telephone company.

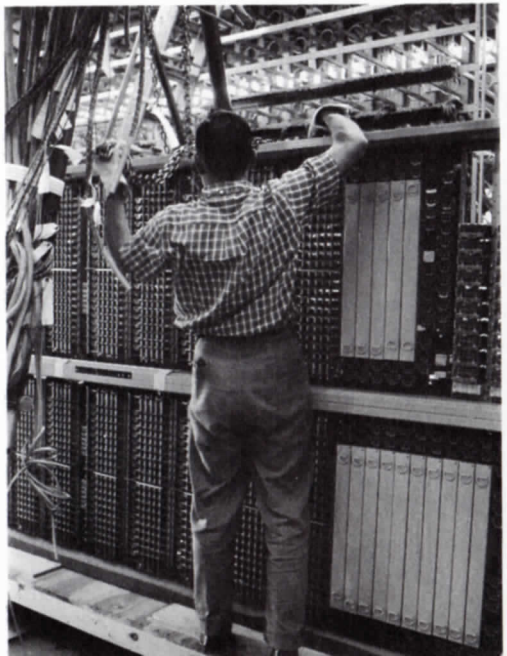
In their efforts toward achieving System-wide economies and service improvements, Systems Equipment Engineering, in collaboration with its Bell System counterparts, has recently introduced such items as: electronic data processing machines, which translate certain telephone company outline specifications into detailed information; simplified equipment order forms, which allow the telephone companies to order facilities by name instead of through a reference to specification or drawing numbers; microfilmed engineering drawings for use throughout the entire Bell System; and completely packaged dial central offices and private branch exchanges.

SERVICE...

Installation

Left: The birth of a central office begins with an empty building, reels of cable, crates of apparatus and a crew of installers. Above: A WE installer runs myriad "vines" of cable along an overhead cable trough and down to prearranged positions. The installation of a 10,000 line dial central office may require up to 30,000 man hours.

Day by day, week by week, a central office grows. Heavy frames of switching apparatus, made at Western Electric plants are carefully installed (below). A 10,000 line dial office requires as much as 225 tons of switching and power equipment.



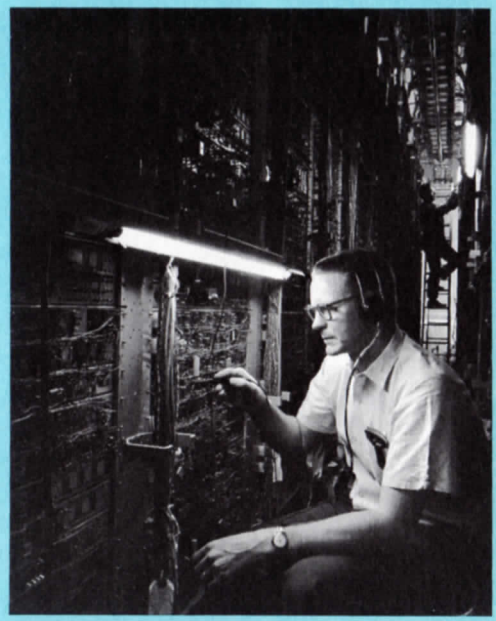
WHEN YOU PICK UP A TELEPHONE and call someone just down the street or in another country, your voice first passes through a central office or exchange located in a telephone company building. The central office is essentially a large switching system—a remarkable array of transistors, electron tubes; wires, relays, switches, and other components—which channels your call and thousands like it to the proper destinations.

Back in the 1880's it was not unusual for the men who built the switching equipment in the shop to go out and install the same equipment for the telephone company. In that way, the customer was assured of a top-notch installing job by the same company that made the equipment.

The principle is much the same today. But the job is largely handled by WE's Installation organization—a mobile force of thousands of skilled personnel who each year install equipment which will provide almost 3,000,000 telephone lines in more than 7,000 communities.

Included in this work are not only central office jobs for the telephone companies, but many special assignments such as large switchboard installations for business and government, installation of radio relay stations and terminal equipment for oceanic telephone cables.

The installation and test of a new 10,000 line dial central office for one of the Bell Telephone operating companies requires approximately 1,500,000 feet of wire, 500,000 wire connections and 225 tons of switching and power equipment. Obviously, no one is more familiar than the manufacturer with the requirements for the proper positioning, wiring and testing of that equipment. That is why the task usually is entrusted to the WE installer—an important link in the Company's function of providing switching equipment for the Bell System.



Now virtually complete the central office undergoes final tests before it is cut into service for use by one of the Bell Telephone companies.

Top: Teletypewriters, vital supplements to the nation's telephone service, are an important part of distributing house operations. Skilled technicians custom-assemble and recondition more than 80,000 units a year. Above: Assembly of aluminum telephone booth nears completion. Distributing houses handle some 23,000 each year.

SERVICE . . .
Distribution and Repair

Supplying new equipment and supplies and repairing service-worn equipment are the main business of distributing houses. Left: Lift-truck operator takes down pallet of apparatus needed by Bell Telephone Company. Below: Telephone set progressive repair line.

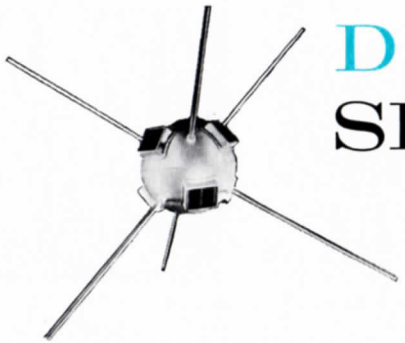
UNDER ITS SERVICE DIVISION, Western Electric operates a nation-wide chain of "stores" called distributing houses. Each of these stores has one primary customer—the local Bell Telephone company—and its job is to see that this one customer is furnished superlative service.

The 35 distributing houses serve the Bell telephone companies in two chief ways: they furnish supplies and equipment and they recondition service-worn telephone items. In addition, the distributing houses work closely with WE's Marketing organization which makes certain that Western Electric is offering the products, services and supplies that the Bell companies want and need.

Through the distributing houses pass the orders which the Bell telephone companies place on Western Electric. Some orders are filled from local distributing house stocks. Others are forwarded to our Merchandise organization for shipment, and still others are placed on outside suppliers either directly by the House or through the Supplies Service organization on contracts arranged by the Purchasing organization.

Often, after a disaster, distributing houses must quickly furnish great quantities of materials which the telephone companies need to repair communications lines and restore telephone service.

As many as ten million telephone sets a year are reconditioned in the distributing house repair shops, along with teletypewriters and other items of communications equipment. The savings to the telephone companies achieved in this way have helped materially in providing low-cost telephone service to the public.



DEFENSE AND SPACE ACTIVITIES

WESTERN ELECTRIC'S LONG EXPERIENCE in the communications field and its access to the engineering and management resources of the various Bell System companies have led the U.S. Government to call upon us for assistance on a number of challenging defense and space activities.

For example, Western Electric led an industrial team which built the world-wide communications and tracking network for Project Mercury to give America's astronauts a voice in space. Other assignments have included the construction of the DEW Line across the frozen Arctic; the White Alice communications network in Alaska; the SAGE System of continental air defense; the rearward communications network for the Ballistic Missile Early Warning System (BMEWS), which links detection stations in Alaska, Greenland and the United Kingdom with NORAD Headquarters in Colorado; and the management of Sandia Corporation which works on non-atomic aspects of nuclear weapons for the Atomic Energy Commission.

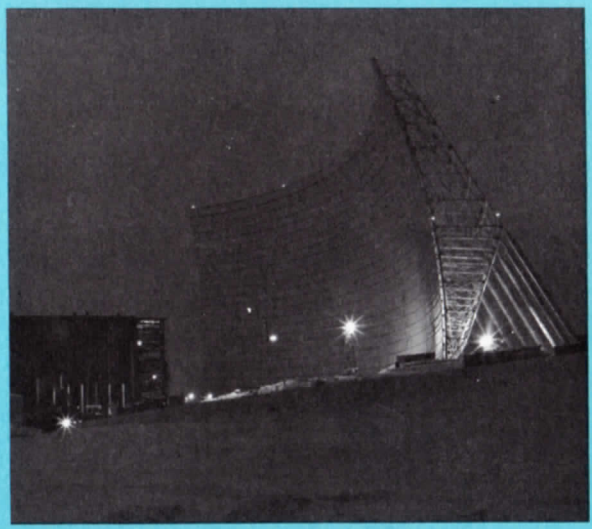
Western Electric was prime contractor for the development and production of the Army's Nike Ajax and Nike Hercules guided missile systems. In 1955, the Army asked WE and Bell Telephone Laboratories to undertake the development of an anti-missile missile system, which led to the Nike Zeus and then to the more advanced anti-ICBM system, Nike X.

Western Electric also supplies the Navy with weapons direction equipment for missile ships, missile impact locating equipment for the missile ranges, radars and anti-submarine warfare gear, along with many items of communications equipment. Installation, maintenance and operating assistance are furnished for much of this equipment by Western Electric field engineers.

Bell Telephone Laboratories-Western Electric command guidance equipment, designed for the Air Force Titan I ICBM, has successfully guided many ballistic missiles and space satellites, including the Telstar communications satellites, into precise orbits.

At the request of the National Aeronautics and Space Administration, the Bell System established Bellcomm Inc. Owned jointly by AT&T and Western Electric, Bellcomm will provide planning and systems engineering support in the manned space flight program to land men on the moon and return them safely.

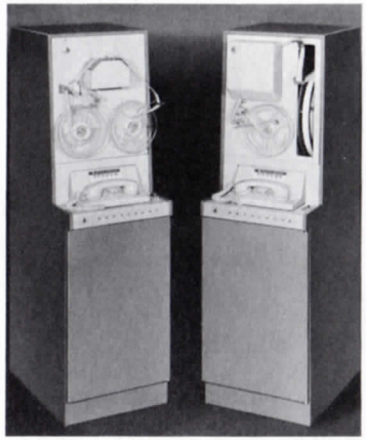
Nike-Zeus is launched during a test firing at White Sands, N. M. The Zeus acquisition radar stands in the foreground.



Huge antenna of a BMEWS station against the arctic night. WE handled the design, installation and testing of the rearward communications network for the system.

Located on a 105-acre site in Skokie, Illinois, a northwest suburb of Chicago, eight modern buildings house the general offices, main manufacturing facilities and Research Center of the Teletype Corporation. The company also operates a small plant in Little Rock, Arkansas.

Teletype printers provide direct printed communications between two or more points. Messages and data can also be punched first in paper tape and transmitted automatically.



Teletype high-speed punched tape equipment is featured in Dataspeed, a Bell System service for sending and receiving large volumes of taped data over regular telephone lines.

PRINCIPAL SUBSIDIARIES

TELETYPE CORPORATION. The teletypewriter is to the typewritten word what the telephone is to the spoken word. With it, messages and data can be sent locally or long distance. Not only does it offer a means of transmitting data wherever it is needed, but it provides a record at all points —either in typewritten form or as a strip of punched paper tape.

Teletype Corporation, a Western Electric subsidiary since 1930, manufactures the teletypewriter equipment used in the Bell System. Teletypewriter exchange service (TWX) operates through the Bell System telephone switching network and has a growing nationwide directory listing of some 60,000 subscribers. The Bell System also offers various private line teletypewriter services.

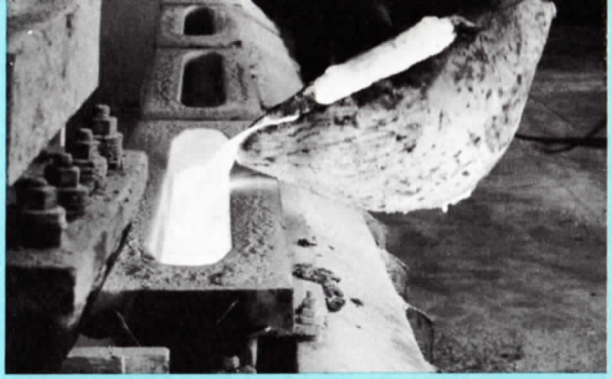
The teletypewriter is a versatile communications tool. It brings news dispatches to the press, flashes "buy" and "sell" orders to the stock exchange, collects and distributes weather data, feeds computers and enables branch plants to keep in close touch with headquarters. It also plays a vital role in the nation's vast defense and space programs.

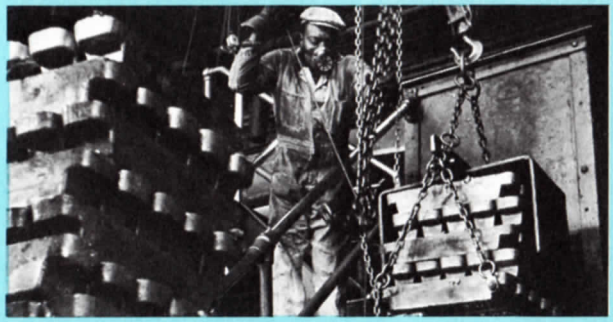
NASSAU SMELTING AND REFINING COMPANY. When Bell telephone equipment finally wears out or becomes obsolete, much of the non-ferrous metal in it is reclaimed for use in the manufacture of new equipment.

To centralize scrap reclamation and to help assure the Bell System of a dependable supply of non-ferrous metals—brass, bronze, copper, lead and solder products—is the job of Western Electric's subsidiary, the Nassau Smelting and Refining Company, Inc., at Staten Island, N. Y.

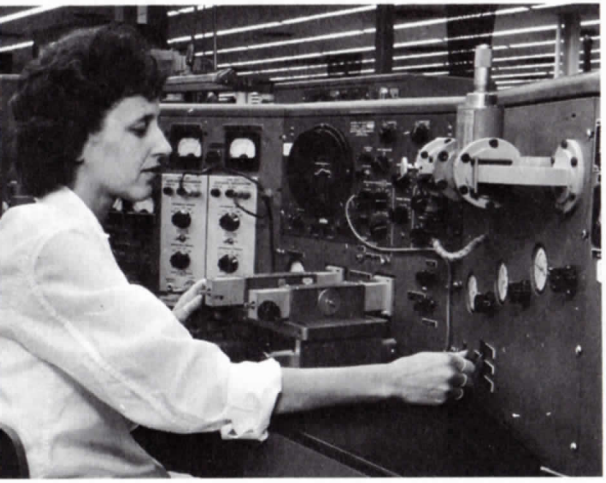
Into Nassau each year pour thousands of tons of scrap from the Bell System. From it is retrieved more than 200,000,000 pounds of metal. Huge cauldrons, heated to thousands of degrees, refine the scrap metals to purities as high as 99.94 per cent.

These metals are reclaimed at a saving compared with the cost of metals obtained from ore. In addition, Nassau becomes even more important for supplementary supply during periods when other supplies of metals are scarce.





With skillful and precise execution, a Nassau furnace operator rams a clay plug into the spout of a roaring blast furnace (left). The furnace is used to extract the very last bit of copper from the "slag" or waste of other furnaces. Two hundred and fifty pounds of steaming, molten 2000-degree copper are carefully poured from a huge bull ladle into an ingot mold (top). Nassau's furnaces operate around the clock. When the huge ingots are finally cool, they are sent to Western Electric plants for use in new equipment. Above: ingots of copper, 99.94 per cent pure.



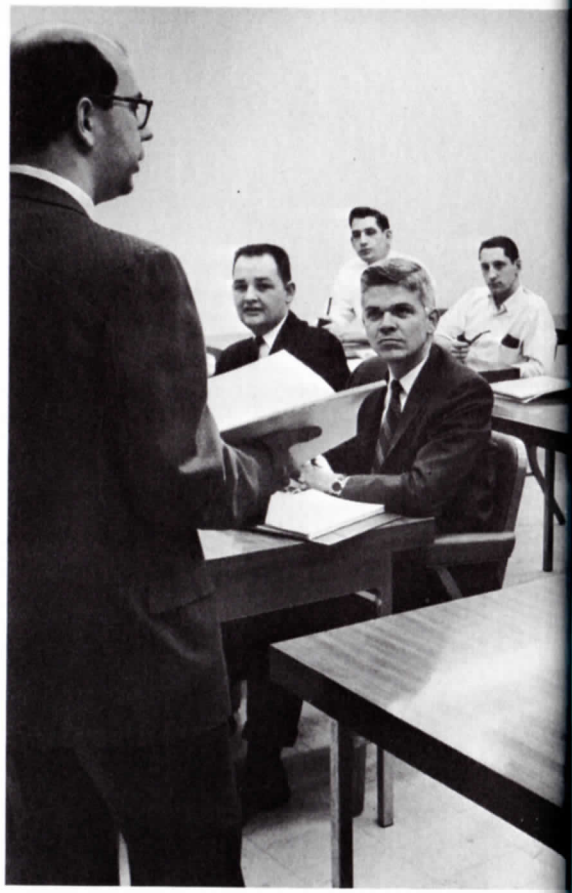
WESTERN ELECTRIC IS PEOPLE

WHAT MAKES A COMPANY OUTSTANDING? Modern, efficient facilities, technical skill, years of experience? It's true that all of these are important. But, in the final analysis, a company must depend on an even more important asset —its people.

Today about 150,000 people work for the Company. They are guided by the same considerations of service, quality and cost that have always characterized Western Electric. In this respect, they share with their counterparts in Bell Laboratories and the operating telephone companies the desire to provide this nation with the best possible telephone service at reasonable cost.

WE has been fortunate in attracting and keeping people who have this sense of purpose. The Company does its best to encourage employees to develop their abilities to progress in their careers.

As part of its training and development program, WE conducts job training in specific skills at each Company location. In addition, intensive off-the-job courses are offered to management and engineering people, along with orientation seminars for newly hired college graduates and management training courses for each of the first four levels of supervision. And each year, hundreds of WE employees at all levels participate under our Tuition Re-



WE's many training programs are designed to provide incentives for personal growth and development to both new and long service employees. At left: WE recruiter conducts informal on-campus interview; and an instructor lectures to class of Lehigh Program participants.

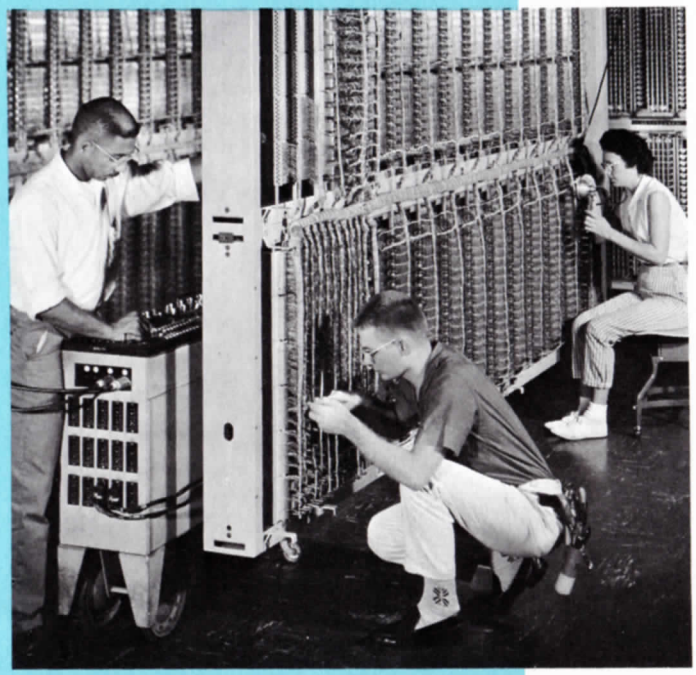
fund Plan in out-of-hours graduate and undergraduate college courses related to their current or prospective work.

Among the most intensive of these programs is the Graduate Engineering Training Program, designed to help engineers keep abreast of technical developments in manufacturing and communications, and the Lehigh University Master's Degree Program conducted at WE's Engineering Research Center. There selected engineers divide their time between classroom work and on-the-job engineering research on specific projects.

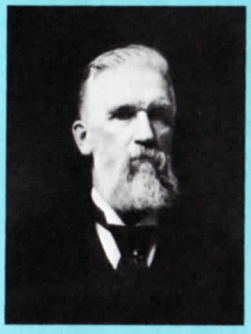
The Company's on-the-job safety record continues to be among the best in industry through the conscientious and sustained efforts of its people. And since statistics show that several times as many injuries occur away from work, WE has inaugurated an extensive educational campaign to increase employees' awareness of off-the-job hazards.

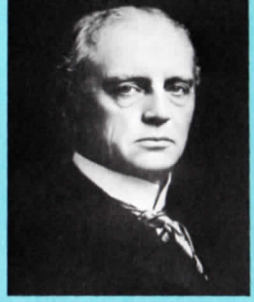
Among the benefits provided WE people are: sickness, accident and death benefits, an extraordinary medical expense plan, a liberal pension plan, low-cost life insurance, liberal vacations, and military and reserve duty leaves.

WE has a policy of promoting from within. Employment is on the basis of qualification without regard to race, creed, color, national origin or age.



At whatever job WE people find themselves they bring to it the same skilled craftsmanship that has always distinguished Bell System efforts.





YEARS OF GROWTH

WESTERN ELECTRIC began operations in a Cleveland loft in 1869 as the firm of Gray and Barton. Its purpose: to build quality telegraph instruments and other electrical products.

Its founders were Elisha Gray, a physics professor and inventor; Enos Barton, a former telegrapher; and General Anson Stager, who had been chief of military telegraph for the Union forces in the Civil War.

The firm moved from Cleveland to Chicago, and in 1872 changed its name to the Western Electric Manufacturing Company.

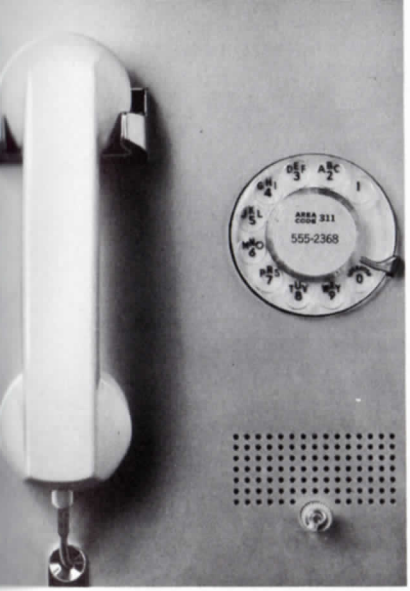
After the telephone was invented in 1876, Western Electric became one of a half-dozen firms competing in the production of telephone equipment. But in 1882, the fast-growing Bell Company acquired a controlling interest in the Western Electric Manufacturing Company and shortened the name to its present form.

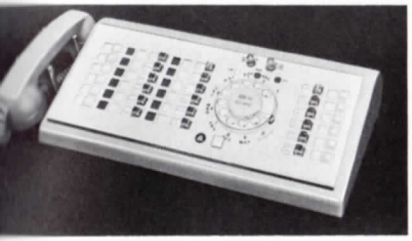
In the intervening years, telephony has moved from a wooden telephone with a crank to nation-wide direct distance dialing, and the Company has grown and changed in many ways. When WE began work for the Bell System in 1882 there were 90,000 phones in the country. About the turn of the century there were 1,300,000 and many millions more to come. So in 1903 WE built its first modern factory, Hawthorne, in Chicago. The Kearny (N. J.) and Baltimore Works went up in the Twenties. In recent years Western Electric has carried out a major construction and expansion program to meet the demand for telephone equipment and national defense communications systems.

To the Western Electric manufacturing job was added, early in the century, the work of purchasing and distribution for the Bell System. WE signed a supply contract with a Bell operating company in 1901 and that year established the first of its distributing houses to serve the telephone companies. The relationship thus formed has remained one of the most unusual in modern industry: nothing in WE's relationship with the Bell operating telephone companies requires them to buy Western Electric products; we can retain their business only by virtue of the quality of our products and services and our low prices.

The period since World War II has been one of further dynamic change for Western Electric, which now ranks among the top companies in the nation in terms of number of employees and dollar volume of sales.

Now, as we enter the Spage Age, WE is responding to a host of new challenges in the science of communications.





New products and services are constantly being developed through the coordinated efforts of Bell System people to provide more diversified and flexible communications. The products at left, experimental just a short time ago, are now standard Bell System items.

TOWARD THE FUTURE

NO ONE CAN PREDICT the future with accuracy, but there are Bell System people who are already reckoning with the years to come. They are planning and working on the telephony of tomorrow.

From almost any perspective the future of telephony appears bright. In a rapidly growing America, the demand for telephone service is expected to reach phenomenal proportions. Today, about three-quarters of all American families have the convenience and protection of a telephone in their homes. By 1975 it is estimated that the number of subscribers will have increased to a point where

Optical masers now under development by the Bell System are potentially the most efficient information carriers yet conceived.

as many as 90 or more out of every 100 households in the United States will have telephone service. This will amount to about 63 million households with telephones in use.

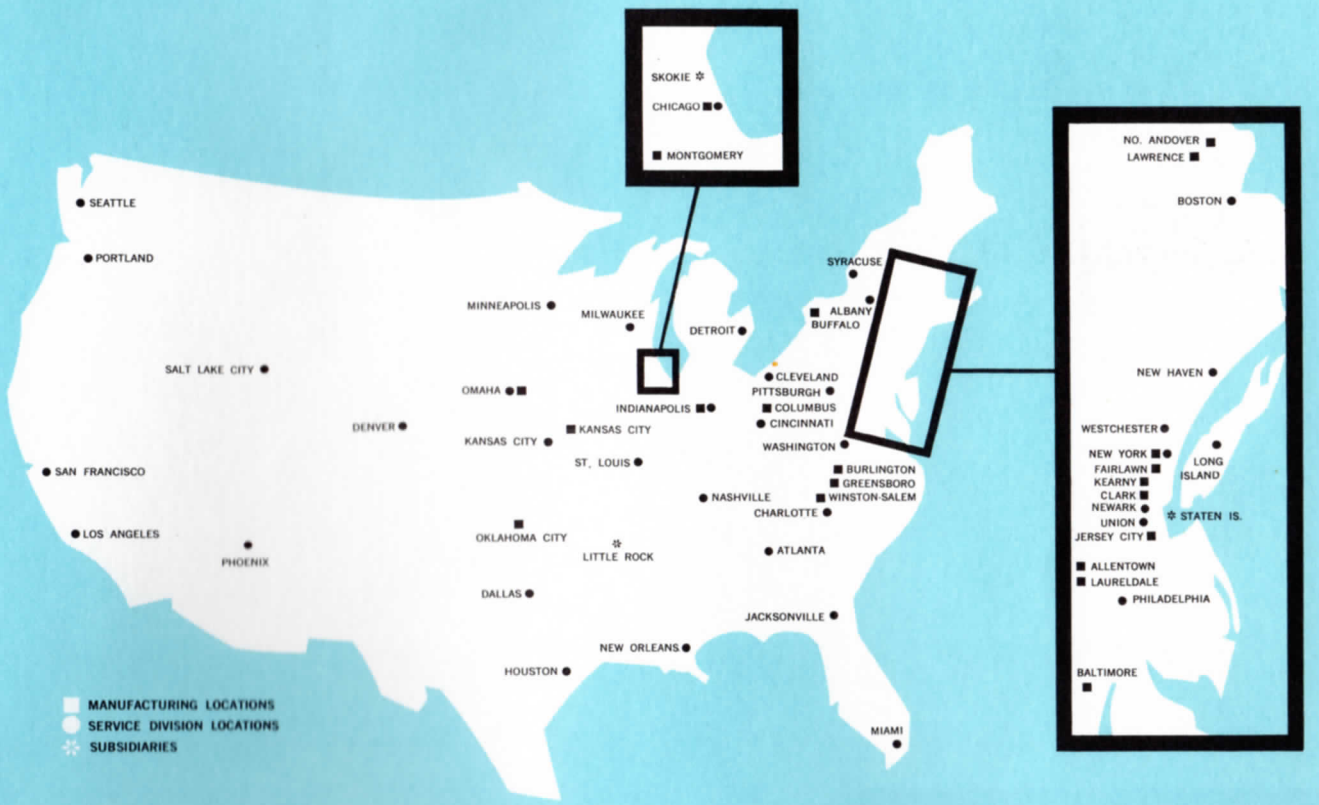
Engineering advances and the influence of contemporary design are already altering the appearance of the telephone and will alter it still further. At special shops in key WE plants, working models of future telephone equipment are being made in small quantities for testing purposes.

Included are sets equipped with Speakerphone transmitters and controls for hands-free conversation. Others have small "space saver" dials situated at the top of hang-up sets, and on some these dials are in the handset.

At Bell Telephone Laboratories development work is under way on even more exciting telephones, apparatus and systems—picture-phones, which permit a user to see as well as hear the person he talks with; the optical maser which produces an intense and narrow beam of coherent light, by which information could conceivably be transmitted through outer space and from one point to another on earth; and communications satellites similar to Telstar to receive, amplify and transmit telephone and TV signals between continents. And, while voice communication undoubtedly will increase greatly in the coming 25 years, it is anticipated that machine communication—the transmission of data between processing centers—will someday challenge it in volume.

The future appears to hold much in store for Western Electric: although electro-mechanical switching devices and equipment will be developed to greater levels of sophistication, we may expect that electronic devices will be used in ever-increasing numbers. Units will be smaller in size and will incorporate more miniaturized circuits. Certain types of units will be produced to operate at extremes of temperature, as in the case of mesa transistors, which will function at 450 degrees below zero. Plastics will be used increasingly in a variety of ways. Automatic machines, many pre-programmed on coded tape, will be used more and more, while giant computers will help direct production machines.

But while there may be new ways, new equipment and new materials, the goal will be the same: to help the Bell System give better communication service to more people.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